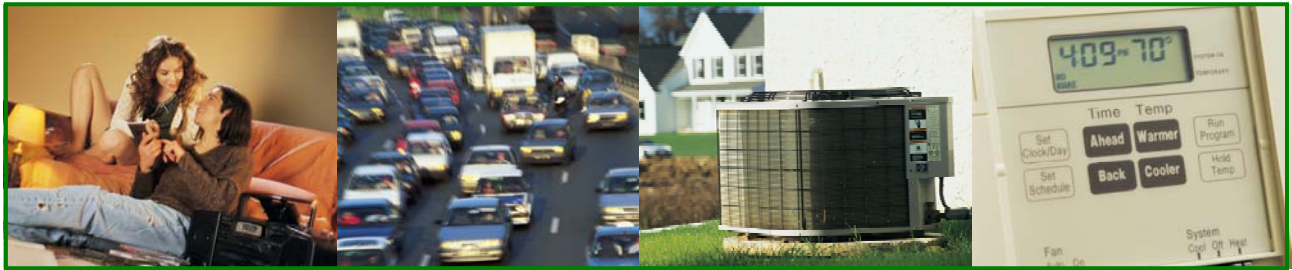


Dryvit Systems and Green / Sustainable Design



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How Do You Know Your Product Is “Green”?

What is a green product? A green product is a building component that has minimal or no negative environmental impacts or allows for the elimination or substitution of potentially hazardous materials. There are many criteria that classify products as green. Some products fall into only one green classification, while others may fall into multiple classifications, such as durability, longevity, zero or low off-gassing / toxicity, resource efficiency, environmental impacts, energy efficiency, and others.

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The difficulty in creating listings for an environmental building product is to figure out what classifies a product as green and assessing at what point the negatives out-weigh the positives¹. Products with numerous benefits could be designated green even if that product does not fully meet one classification because the product's total environmental performance is benefiting the project's overall design. In green building projects there are so many different materials being incorporated into a given design that not all will be classified as green products. However, the way those products are implemented into a given project may indeed help to improve the project's long-term performance or help to eliminate non-green products.

In creating a green design, careful attention must be given to all aspects that govern the design of a given project. Products and materials should be combined with a design and site to reduce the negative effects on the environment¹.

Due to a variety of factors, buildings today are more airtight than in the past. This results in structures that keep exterior contaminants out and, conversely, hold interior contaminants inside for more extensive periods of time. The use of green products creates a healthier environment on the exterior but just as importantly on the interior, where the users spend a majority of their day.

VOC's: the Silent Factor Inside Your Building

One of the biggest yet overlooked aspects of our lives is the air we breathe. Volatile Organic Compounds (VOC's) “off-gassing” and other airborne particles, which could be carcinogenic, fill our lungs every day. Many of these VOC's come from paints and adhesives used all around buildings, even insulation. Care needs to be taken when selecting products not only for VOC content but also for residual VOC levels over time. Minimizing or even eliminating as

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many of these harmful chemicals as possible can only help the quality of our designs. Dryvit coatings and adhesives are water based, and therefore do not have harmful or toxic off-gassing properties. Because the Dryvit materials are used on the exterior of the building the materials do not negatively affect the indoor air quality. The Expanded Polystyrene Insulation (EPS) used to create the insulation properties inherent in the Dryvit system has no off-gassing properties. The bead expansion / molding process uses steam and trace amounts of styrene dissipates shortly after molding. Dryvit products are generally considered environmentally inert because they do not break down into harmful byproducts; in fact farmers use EPS beads as a means of improving soil aeration.

A driving force for many designs, such as schools and hospitals, is the use of products that contribute to a safe, healthy indoor environment. Currently designers need to be more conscientious about the interior environment because buildings are occupied more often than they are not. Designers need to be more aware of occupants of their facilities and need to ensure top rate indoor air quality. The ability of that product to block introduction, development, or spread of indoor contaminants is another consideration when trying to classify a product as green. The use of Dryvit systems generally will improve indoor air quality because the products used significantly reduce air infiltration and therefore minimizes the amount of moist air that is entering through walls.

With the implementation of new energy codes, (for example, the new Massachusetts Energy Code), code bodies are beginning to recognize the importance of addressing the issue of air and vapor movement through wall assemblies. Dryvit products meet these new codes with the substitution of polyethylene or sheet type vapor barriers with a water based material that has been engineered and tested for use with Dryvit systems. Proper configuration of the appropriate components – combined with expert design assistance from a highly qualified staff of engineers, chemists, architects, customer service and field service representatives – makes for a long lasting product designed for the life of a given building.

Some products may not be considered green on their own, but when taking into account the existing conditions on a given project, the substitution of one product for another could contribute to the classification of the project as green. The ability to eliminate harmful, carcinogenic or non-environmentally friendly materials may also come into consideration when trying to determine if a product is green or not. The installation of fiberglass insulation has been known to adversely affect the respiratory system³, and the reduction or even elimination of such or worse products can only help protect human interest. The fact that the

insulation layer of the Dryvit system is on the outside of the structure contributes to improving the indoor air quality of the building.

Energy Ratings Are Important

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Energy and resource efficiency are big factors when designing structures with green ratings. More often than not the residual environmental impacts of operating a facility often outweigh the constructing of a building. The energy use of a building is probably the greatest environmental impact of a building, so designing buildings for lower energy consumption should be a project designer's first priority.² Dryvit systems contribute significantly to the energy efficiency of a building. By adding a continuous layer of insulation on the exterior of the wall and by minimizing thermal breaks, the insulation layer is more efficient and also improves the efficiency of the cavity insulation. Also EIFS, with its high insulation value, could be installed on a wall and potentially allow for the elimination of cavity wall insulation.

The versatility of EIFS with respect to renovation and retrofitting of existing buildings is in many cases a cost effective and resource conserving practice. Early twentieth century buildings are filled with an abundance of materials and cultural resources, which add to the ambiance of the structure. In some structures the workmanship and quality of materials present may be impossible to replicate today, making the restoration of such buildings all the more valuable.² The most important restoration practice is maximizing energy efficiency and one of the easiest ways to achieve this is to insulate the exterior of the building using EIFS. By installing EIFS the infrastructural integrity is maintained all while improving insulation value, curbside appeal, indoor air quality and reinforcing the weather resistive barrier / cladding.

Adding insulation on the exterior in northern climates increases the wall cavity temperature, minimizing the potential for condensation inside the wall cavity. Any condensation that may form occurs inside the EPS and is either managed by tested rain screen methods or evaporates within the system and moves to the exterior through the permeable coatings. For southern climates, the reduction of air infiltration minimizes heavily saturated moist air from entering the wall system, again reducing potential for condensation and mold growth.

A recent study by an independent testing agency, Oak Ridge National Laboratories, used the Guarded Hot Box Test, to compare the most common veneers used today. Dryvit EIFS were determined to be at least 84 percent more energy efficient than other claddings that were tested. This test evaluated the "effective wall

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R-value" rating, considering thermal breaks as well as typical building details (floor lines, windows, headers, corners, etc.). The wall assembly tested consisted of 1/2" interior gypsum, 3 - 5/8" steel stud cavity with R-11 fiberglass batts, 1/2" exterior gypsum (typical) and 2 inches of EPS with Dryvit coatings, or one of the six other typical claddings utilizing proper detailing and components. Using those wall materials a surface-to-surface Whole Wall R-value Test was performed resulting in an effective R-12.9 for the Dryvit system, with the closest other cladding tested at R-7.34 resulting in the Dryvit EIFS having an R-value almost two times greater than its nearest competitor. Whole Wall R-value is defined as R-value for the whole opaque wall including the thermal performance of not only the "Clear Wall" area but also all typical envelope interface details (e.g. wall / wall (corners), wall / roof, wall / floor, wall / door, and wall / window connections). Conclusion from Oak Ridge: "the results show that the Dryvit wall system is the most energy efficient wall system from all seven analyzed technologies. Clear Wall and Whole Wall R-value comparisons prove that Dryvit is significantly more energy efficient than other wall technologies offered for commercial buildings. It should be considered as a primary material choice for construction of energy efficient commercial buildings in the U.S."⁵

Life Cycle Costs: A True Measure of Value

Another green listing classification is the Projected Life Cycle Costs of a given product (i.e. longevity, cost, environmental issues associated with maintenance, etc). This classification includes products that are durable and do not need constant maintenance, repair or replacement. One of the principal appeals of the Dryvit system is the longevity and versatility of the product in a multitude of building conditions. In addition, maintenance and repair do not require extensive demolition or the use of harsh chemicals.

Dryvit systems utilize a reinforcing mesh embedded in a base coat applied over the exterior face of the EPS for durability and impact resistance. Dryvit systems are a high-performance product designed to perform for the typical design life of the building (typically 30 years), as opposed to throwaway products, which may create disposal issues. A life cycle cost analysis was performed by a third party company comparing Dryvit systems and six other common claddings, with typical expenses such as installation, maintenance, repair, and inflation taken into account. The wall systems tested had to meet a minimum R-12.5 over a 20,480 square foot wall area. The analysis took into account thermal bridging, typical framing for each cladding tested, and nationally recognized construction costs, maintenance costs, and frequency of maintenance. "(Dryvit) ranked high in cost

effectiveness when compared to the alternative systems analyzed. In fact, the (Dryvit system) has one of the lowest life cycle costs of the cladding and framing assemblies, which are under consideration for the model building. The present value costs cited in the example can be considered conservative since the costs were calculated based on a model comprised of flat monolithic walls which are atypical of today's construction design and methods. In conclusion, (Dryvit) attained its high ranking in the analysis despite the fact that some of the most beneficial aspects of (Dryvit systems), such as aesthetics, speed and ease of installation, and thermal efficiency were not considered."⁴

Conclusion

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As principal decision makers in product selection, application method, and designs, it is important that architects, builders, and applicators be more conscientious about the buildings in which many of us spend the majority of our lives. Today, more than ever, we as the building industry need to recognize that with new codes and restrictions comes responsibilities to ensure the health and well being of the ultimate consumer. Using energy efficient, lightweight exterior cladding options like those offered by Dryvit Systems, Inc. represent a significant step in that direction.

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