THE EMERGENCE OF GREEN BUILDING STANDARDS AND CODES

By Tim Serke, American Institute of Architects

Green building is here to stay. Gone are the days when green building was viewed as merely a cutting-edge, progressive phenomenon, affecting only a few of the most environmentally-friendly building projects. It is now fully incorporated into mainstream thought in the construction industry and is having a widespread influence. As green building programs flourish, they represent a fundamental change for the building and construction industry.

This, in turn, signifies a difference in how paint and coatings are not only regulated, but how these products are evaluated, compared, specified, and selected. This article provides a background, outlining how the green building market is expanding and where it is evolving from voluntary programs to mandatory code requirements. Discussion on theLeadership in Energy and Environmental Design (LEED) rating system, the most prominent green building standard in the United States, will be woven in throughout. Also highlighted are emerging trends in this space—especially those that directly affect the paint and coating industry—such as the concept of healthy buildings and radon transparency.

THE RISE OF GREEN BUILDING

Sustainable design and construction, high-performance building, or just simply “green building” all represent basically the same thing and can collectively be referred to as green building.4

Green building is defined as an approach to the siting, design, construction, renovation, and operation of buildings to reduce the overall negative impact of the built environment on the natural environment and human health.4 Green building is a broad term that is used to describe a number of activities under this umbrella, but most green building schemes seek to address a few key issue areas: the building location and site, energy efficiency, water conservation, materials and resources, pollution and waste, and indoor environmental quality.4 Green building programs come in different forms—from voluntary rating and certification systems in the private market to binding government regulations and mandatory building codes. The rationale for high-performance green building stems from the desire to reduce the negative environmental impact of buildings and construction, save energy and money, conserve resources, and protect the health of building occupants.4 Many of the actual benefits are well-documented, but others may be exaggerated or illusory.5 Either way, the green building movement has continued to flourish since its inception a few decades ago.

Environmental laws have expanded from traditional forms—federal, state, and local government laws and regulations—to the private sphere, where standard-setting occurs through nongovernmental actions and institutions. This expansion beyond public law is referred to as “private environmental governance.”5,6 In essence, “actions taken by non-governmental entities that are designed to achieve traditionally governmental ends...”5 Consumers, corporations, nonprofit organizations, and other nongovernmental actors have sought to address environmental and human health concerns where government actors have left off. Green building is a significant form of private environmental governance that has emerged over the past decade outside the traditional public governmental framework. Private green building standards are generally developed through different processes involving a standard-setting organization’s staff, experts in the construction and design fields, technical advisors, product manufacturers, and other interested stakeholders. Since the development of these green building programs lies outside the traditional governmental regulatory process with its associated safeguards, it is vital that green building certification programs or standards have a clearly defined development process that is open, balanced, and transparent, meeting full due process procedures.

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The LEED Rating System

Green building began as a small niche market in the 1990s outside the governmental regulatory world, and has since proliferated. In the United States alone, the value of green building has grown eightfold from 2005 to 2011.4 In 2012, green building was estimated to represent 44% of all commercial and institutional construction, and this piece of the pie is expected to grow to 55% by 2016.4 The LEED rating system has been at the forefront of this growth. Since the launch of the LEED rating system in 2000, 102,742 projects are currently participating in LEED in some form, comprising more than 9.9 billion square feet of construction space.4 LEED is the most recognizable green building program in the U.S. and epitomizes the rapid changes in the marketplace and the emerging trends that will be discussed in this article. The U.S. Green Building Council develops, implements, and administers the LEED rating system, which, at its core, is a certification program based on a number of individual green building practices or credits, from increasing the energy efficiency of a building to reducing its demand for water. Projects are awarded points for achieving these credits, and these points allow a project to attain a desired level of certification, from the base LEED certification to silver, gold, and platinum. Since LEED 1.0 was launched in 1998, the rating system has undergone multiple revisions. The fourth version, or LEED 4.1, was recently adopted on July 1, 2013 and includes drastic changes to the program, some quite controversial, increasing the complexity and the rigor of the rating system. As the most prominent green building standard in the United States, the green building practices in the LEED rating standard trickle down in the marketplace and heavily influence other green building standards and codes.

Federal, state, and local governments have played a pivotal role in fostering the growth and market demand for LEED and other green building standards. Government institutions and agencies reference green building standards for public construction or incorporate green building requirements into their procurement guidelines or policies. Nearly every federal agency, from the Department of State to the National Aeronautics and Space Administration, requires varying levels of LEED certification or an equivalent for agency construction.

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From Voluntary Programs to Mandatory Codes

The voluntary nature of green building may soon be ending. State and local jurisdictions are moving beyond recommending voluntary green building rating systems and are now adopting mandatory, overlay green building codes. In contrast to voluntary programs, green building codes supplement or are included within a city’s or state’s official building code and are fully binding, not only causing the force of law and imposing mandatory requirements on building and construction, Green building codes are even starting to overrule federal and state product volatile
The Emergence of Green Building Standards and Codes

By Tim Serhe, President, Green Building Council

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organic compound (VOC) regulations for paint in some instances. For example, the California Resources Board used its model architectural paint regulations in 2001. Since then, one of California's 35 air districts has implemented similar standards regulations. In contrast, since January 1, 2011, CA.Green, the state's new mandatory overlay green building code, incorporates some similar rules for all new construction, California is not alone. Other state and local jurisdictions are adopting mandatory green building codes like the International Green Construction Code (IGCC), for individual localities. Washington, D.C., for example, is in the process of adopting the IGCC for all new or substantially renovated commercial buildings larger than 10,000 square feet and multifamily buildings four stories or taller.

For the architectural paint and coatings industry, the rise of green building certification programs, standards, and codes represent fundamental change. Under the traditional regulatory framework, air pollution control agencies, whether at the federal, state, or local level, impose mandatory VOC regulations on architectural paint. "It is unlawful for anyone to supply, sell, offer for sale, or manufacture any architectural coating that does not meet a VOC limit of x." On the other hand, green building rating systems and certification programs do not force paint manufacturers to meet the requirements, yet they still have a significant impact on how projects and customers specifically architectural paint and coatings.

Green building standards contain a variety of requirements that can either directly or indirectly influence the choice of paint, coatings, adhesives, and sealants products that are used in building construction. This drives consumers, downstream users, retailers, architects, designers, and specifiers to ask new questions and make new demands. The question is no longer simply "what is the VOC content of this can of paint, and does it comply with the regulations in this jurisdiction?" Instead, the questions revolve around new requirement standards: what chemicals are in this product and what hazards are associated with these chemicals; what does the product's interior air quality look like; how will this product impact indoor air quality and human health; or what are the environmental life-cycle impacts of this product.

**EMERGING TRENDS: HEALTHY BUILDINGS AND TRANSPARENCY**

With the rise of green building, a number of trends have emerged and will continue to grow significantly affecting the concepts of healthy buildings and radon transparency. Concern over the health of building occupants is nothing new, but the green building community has taken up this cause with renewed vigor. Activists in this space argue that green building should be about more than just energy efficiency and cost-effectiveness, pollution reduction; green buildings should address indoor environmental quality, health, and occupant health. Chemical emissions testing evaluations are becoming a baseline for interior building products. With a sense of fervor, many are seeking to prohibit the use of certain chemicals, in any form, in building materials and are demanding "radical transparency"—the disclosure of all the ingredients in a product or building material. As these developments begin to seep into the mainstream, they will have a significant effect on building product manufacturers, especially in the paint and coatings industry.

**Indoor Air Quality**

The principal focus of the paint and coatings provisions in green building standards is to improve indoor air quality in the built environment. The U.S. Environmental Protection Agency (EPA) has identified that levels of some pollutants may be too high for repeated, short-term exposure and may negatively affect health. The EPA estimates that 20% of adult asthma cases are attributable to indoor air pollution.

Green building standards require structures to improve interior air quality and indoor environment. These green building standards include limits on the amount of VOCs in paint to reduce the level of these compounds that are emitted into indoor air environments. These VOC content requirements are often modeled on the stringent state or local laws and regulations in the United States, such as the South Coast Air Quality Management District's Rule 133.3 for paint and coatings.

Green building standards are now moving beyond VOC content, though. Regulatory agencies in the United States have developed VOC content limits to address outdoor air quality impact. The Indoor air quality requirements in green building standards, on the other hand, are primarily concerned with the interior environment, and outdoor air pollution is secondary. VOC content limits are not used as a basis for redlining red or yellow products that will impact indoor air quality and human health; or what are the environmental life-cycle impacts of this product.

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organic compound (VOC) regulations for paint in some instances. For example, the California Environmental Resources Code used its model architectural paint regulation law in 2007. Since then, only nine of California’s 58 air districts have implemented the model paint regulations. In contrast, since January 1, 2011, CALGreen, the state’s new mandatory green building law, allows local governments to adopt voluntary measures to improve indoor air quality in the built environment.

The principal focus of the paint and coatings provisions in green building standards is to improve indoor air quality in the built environment. The U.S. Environmental Protection Agency (EPA) has stated that levels of some pollutants may be too high. In 1999, the building industry has identified that there are regulations that do not meet a VOC limit of 10 ppm. On the other hand, green building rating systems and standards do not yet provide a comprehensive approach. In an attempt to lower the number of VOCs in the environment, every green building program now includes requirements that encourage or mandate VOC limits for interior coatings, adhesives, and sealants to address indoor air quality. Higher VOC levels are often modeled on the state-specific or local laws and regulations in the United States, such as the South Coast Air Quality Management District’s Rule 1153 for paint and coatings.

Green building standards are now moving beyond VOC content, though. Regulatory agencies in the United States have developed VOC content limits to address outdoor air quality at ground-level ozone. The indoor air quality requirements in green building standards, on the other hand, are primarily concerned with the indoor environment, and outdoor air pollution is secondary. VOC content requirements in CIBSE’s Guide to the Assessment of the Impact of Building Products on the Environment have also been triggered by the standards for red-listed products based on chemical ingredients that may otherwise serve important performance or sustainability functions in a product. Raw materials used in architectural paint and coatings may be prohibited regardless of whether they pose any risk to building occupants in the final product form. Ironically, chemicals that are substituted for the banned substance may be more hazardous or pose a greater threat to building occupants than the banned substance itself.

The Challenge of Transparency

LEED v4 is also encouraging radical transparency, the public disclosure of 100% of the ingredients contained in building materials and products. Those who insist on full ingredient disclosure imply that manufactures are intentionally hiding their presence in their products from the public eye. The CEO of the U.S. Green Building Council recently publicly stated, “Another issue of major concern is the fact that organizations that work with the market transparency and accountability. If you even suggest that we bring more information to the marketplace, these folks revolt, and will do anything to keep us in the dark.”

Emerging Trends: Healthy Buildings and Transparency

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Innovative approaches to indoor air quality testing is a path to examine product emissions by measuring emissions and attempting to calculate the long-term impact of chemical emissions on indoor air. Although it is quite extensive and there may be some flaws with using current small chamber testing methods as a screening tool, it has become the most prevalent test for evaluating building materials for chemical impacts. A number of green certification programs rely on small chamber testing to evaluate products to determine whether they achieve certification. Europe is at the center of this activity. Mandatory third-party testing is now in place in Germany, France, and Italy. Despite this progress, the market is still fragmented and accountability is lacking. If you don’t want to know if there are toxic VOCs in your paint?

The Health Product Declaration, a transparent initiative launched in November 2012, is a standardized way for building product manufacturers to report the contents, chemical hazards, emissions, and health effects of their products. The initiative provides building professionals with the information and tools to assess the potential risk of products may be well-intentioned; however, current transparency schemes, such as the Health Product Declaration, do not yet provide adequate protection for consumers. Disclosures of ingredients should be audited against the required SDS format and are not warranted.

These trends are especially problematic for formulated products such as paints and coatings. Paint and coatings manufacturers need to develop proprietary information and the use of a certain raw materials to advance coatings technology and ability to provide products for green building projects. Despite the complex property conditions and stringent requirements without adequate visibility and the ability to provide products for green building projects. Without adequate trade secret protection, sensitive proprietary formulations will be exposed to competitors and the public. Public disclosure requirements will expose sensitive proprietary formulations to the marketplace. Without adequate trade secret protection, sensitive proprietary formulations will be exposed to competitors and the public. Public disclosure requirements without adequate visibility and the ability to provide products for green building projects. 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threaten to disqualify many high-performing, environmentally friendly products that now play a leading role in green building and energy efficiency.10

Green building programs, such as LEED and other European standards, are requesting more information regarding the environmental impacts of products, especially life-cycle assessments. The newest version of LEED rewards projects for specifying products for which Environmental Product Declarations (EPDs) are available. EPDs offer a standard communication tool for those who wish to objectively measure and describe a product's environmental impact throughout its entire life cycle. These life-cycle impacts are generally measured from raw material extraction and processing to the manufacturing process, and may even cover the use of a product and its end of life. The life-cycle assessment examines a defined set of environmental impact criteria, which usually include water, resource, and energy use; greenhouse gas emissions and ozone-depleting emissions; ozone-forming emissions; water pollution; and nonhazardous and hazardous waste production. Research on life-cycle assessments will increase as end users and consumers seek to gain a more holistic view of the environmental impacts of products.

CONCLUSION

Green building standards and codes will continue to expand and shape the building industry. As sustainable building is becoming commonplace in the new construction market, green building programs are seeking new territory. The U.S. Green Building Council is now striving to transform the current building stock, towing its LEED for Existing Buildings: Operations and Maintenance. As green building standards and codes are adopted faster than traditional government regulations, product manufacturers must stay keenly aware of new developments in sustainable design as a baseline for continued market access. The pressure on product manufacturers to meet new requirements and provide additional environmental information will continue. As key stakeholders in the building construction supply chain, building product manufacturers must actively engage in the green building standard-setting process to ensure that their technical expertise and perspectives are heard.6

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MAPPING COATINGS IN THE UNITED STATES:
A Regulatory Review

By Marie Holson, American Coatings Association

MARINE COATINGS

This past year, California continued to lead the charge by reintroducing a bill focused on the use of copper in pleasure craft coatings (Assembly Bill 425, previously Senate Bill 623), while continuing a re-evaluation of copper as an approved biocide in antifouling coatings (Department of Pesticide Regulations). The California State Lands Commission (CSLC) reconvened the Technical Advisory Group (TAG) working on the CSLC’s biocidal regulations and released a new draft proposal to control biocidal pollution on the hulls of ships entering California ports. In addition to the regulations coming out of California, this article will also briefly discuss the impact of the Pleasure Craft Control Technique Guidelines (ITG), as well as the 2013 vessel general permit (VGP) and the new small vessel general permit (sVGP).