

## Coatings for Sustainable Structures

BY TODD ALWOOD

When choosing coatings for exposed structural steel—and especially when designing for LEED—make sure they don't negatively affect indoor air quality.

**THE GREEN MOVEMENT** is coming to the forefront of the design community, and sustainable steel coatings are just one of the areas that illustrate this trend. Within LEED-NC 2.2, interior coatings for steel are governed by the Indoor Environmental Quality Credit 4.2, entitled *Low-Emitting Materials*, whose intent is to “reduce the quantity of indoor air contaminants that are odorous, irritating, and/or harmful to the comfort and well-being of installers and occupants.” Anti-corrosive and anti-rust coatings applied to steel that is exposed to an indoor space cannot have a VOC content level greater than 250 g/L.

When I heard that, I thought, “Great, but who set that limit? What is VOC? What does that mean for me?”

### Setting Limits

The limit was established in Green Seal Standard GC-03, *Anti-Corrosive Paints*. Green Seal ([www.greenseal.org](http://www.greenseal.org)) is one of several nonprofit groups in the sustainability field that research standards and certify products/services based on these standards. Green Seal was established in 1989, and the above-mentioned standard was issued in 1997. Research in this field is ever-advancing, and adoption of limits and standards tends to occur from west to east across the country.

### VOCs

Now that we know where the limit came from, what's a VOC? VOC stands for “volatile organic compound.” In simple terms, a VOC is a compound or material that vaporizes at typical room temperatures. If the VOC level in the surrounding air is high enough, it can be harmful to vegetation or individuals. To minimize the risk of harm, LEED and Green Seal restrict VOC content on a project level.

### In Practice

All heavy-duty, non-water-based coatings for structural steel contain at least some VOCs, and this becomes a consideration when working on

a LEED project that is trying to tackle LEED credit 4.2 and reduce the VOC level. Credit 4.2 focuses only on VOCs that affect people occupying a space, so for steel this would apply to interior exposed structural steel. If you use a coating on steel that is exposed to an indoor space such as a lobby, then be sure to specify a coating that does not exceed the 250 g/L VOC limit—the limit for metal primers in LEED credit 4.2. The overall percentage of coated surface area for steel compared to that of walls and flooring may be extremely small, but if the project is going after credit 4.2, even the primer for the exposed steel has to meet this limit. There are numerous manufacturers that produce coatings and primers to achieve this limit, so be sure to specify the limit clearly on your construction documents. This requirement does not apply to steel members that are enclosed by building finishes such as suspended ceilings or column covers, because any VOCs in the primer would not be exposed to people occupying the space.

And speaking of primers, probably the greenest decision is not to use primers at all where the structural steel will be enclosed within the building envelope. Such steel does not typically need to be coated or primed, because steel does not rust (beyond a thin surface layer) when it is in a stable environment and not subjected to moisture.

So, when designing structural steel for exposed interior locations, be sure to follow the correct VOC limits—from primer to finish coat—to help achieve your LEED rating and ensure a more sustainable building.



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