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Modern Chemical Industries (MCI) Paints

Green-Buildings' team of LEED Accredited Professionals performed a benchmark analysis of MCI Paints' SOLID product for use in high-performance building applications and determined that it may:

A. **Increase Occupant Comfort and Satisfaction**

Green-Buildings also believes that the use of MCI Paints ' SOLID product is an effective choice when seeking to achieve certification under green building rating systems, such as LEED.

EXECUTIVE SUMMARY

Modern Chemical Industries' SOLID high performance latex paint is an interior/exterior paint designed for enhanced low VOC performance, high quality and durability.

Green-Buildings.com ("Green-Buildings") worked with MCI to complete a review and evaluation of the SOLID latex paint product. Green-Buildings believes that SOLID complies with green building principles and, as such, the product is applicable to high-performance building implementation.

Green-Buildings' team of LEED Accredited Professionals performed a benchmark analysis of SOLID product for use in high-performance building and determined that use of this product may:

A. **Increase Occupant Comfort and Satisfaction**

Additionally, Green-Buildings believes that the characteristics of SOLID paint make it an ideal option when seeking to obtain certification through various green building rating systems, such as US Green Building Council's Leadership in Energy and Environmental Design (LEED®) Rating System.

While no single product may guarantee a credit or building certification in a green building rating system, Green-Buildings believes that the use of SOLID paint may be effective in helping earning credits towards LEED certification[i] in the following category:

Indoor Environmental Quality (IEQ)
Credit 4.2: Low Emitting Materials – Paints and Coatings: 1 Point

PRODUCT DESCRIPTION

Modern Chemical Industries (MCI) is one of the leading manufacturers of advanced high quality paints in the Egyptian market. First established in 1978 by a group of paint production experts, MCI produces materials that are praised for overall quality and longevity in their ability to stand up to the atmospheric conditions present in the Middle East and Africa.

In addition to a wide range of decorative paint products, MCI manufactures its own metal containers to meet its own packaging needs, as well as those of several other customers. Paint offerings include different grades in the following divisions:

- Emulsion paints (gloss, semi-gloss, matt)
- Synthetic paints (gloss, matt)
- Wood varnishes (waterborne, solvent-based)
- Wood adhesives, primers, colorants
- Aluminum paints
- Structural paints and putties

SOLID was also recently certified by the MPI (Master Painters Institute) and PRA (Paint Research Association) to be included on their 'approved products' list, which demonstrates that the product meets these organizations' stringent specification criteria, specifically, the requirements of the performance Standard #53, Latex, Interior, Flat Gloss Level 1.

The MPI Architectural Painting Specification and Maintenance Repainting standards are presently referenced by the Dept. of Defense Unified Facilities Guide Specification, the AIA's MasterSpec, SpecLink, GSA, the Canadian Government's National Master Specification, and many others.

Increase Occupant Comfort and Satisfaction

A key green building principle is to provide a high level of occupant comfort and improve the overall building indoor environment. Studies have shown that individuals can spend as much as 90% of their time indoors, and that people who are comfortable are more productive and generally happier.

In a work environment, increases in productivity can result in overall cost savings to a company due to higher efficiency worker output. The implementation of systems that contribute to better overall controllability can increase occupant comfort and implementation of a web interface allows building maintenance staff to continuously monitor system performance and address potential occupant comfort issues that may arise.

Many indoor paints and finishes release low-level emissions into the air for years after initial construction is completed. The sources of these emissions are volatile organic compounds ("VOC") which, until recently, were integral with the performance of the paint. VOCs are carbon compounds that react to atmospheric photochemical reactions (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonates, and ammonium carbonate) causing them to vaporize at normal room temperatures. But recently, new indoor environmental regulations, coupled with a progressive green building movement, have led to the development of low-VOC and zero-VOC paints and finishes. These new paints are just as durable and cost-effective as their previous versions, but now are less harmful to building occupants and environmental health. Premium performance and decreased environmental impact is the goal for this new class of interior finishes.

High quality interior finishes and paints with low-VOC content can help enhance the indoor air quality of the built environment. Materials with low toxicity levels such as paints, carpet, composite wood, adhesives and sealants should be specified by the project Architect or Interior Designer to limit the introduction of VOCs into the indoor environment.

According to Green Seal Standard GC-03 (which sets limits for anti-corrosive and anti-rust paints), a paint product such as SOLID, with 140 g/L of VOC content, by weight minus water, meets the intent of low-emitting materials for consideration in projects pursuing green building certifications, where the maximum allowable content for gloss, semi-gloss and flat paints is currently 250 g/L.

SOLID Test Results/Performance

This product was submitted for testing to the National Research Center in Cairo, Egypt, on 9/15/2010, in which a SOLID test specimen was submitted and conditioned at 73.4°F and 60% RH with testing equipment recently NIST-calibrated to ensure accuracy. Tests performed on the paint sample included:

- Abrasion Resistance
- Volatile Organic Compound (VOC) Content
- Accelerated Weather Resistance (50 hrs)
- Toxicity
- PH Value

Abrasion resistance is the "ability of a coating to resist degradation due to mechanical wear by hard and rough objects (mechanical erosion) thanks to the ability to dissipate the applied mechanical energy". Results of the Abrasion Resistance test, in which the sample was placed on a Taber Model 505 dual abrasion turntable and subjected to rubbing via rotating abrasive wheels weighted to a specific value and cycled to 1,000 revolutions, showed that total loss from a 61.3099 g sample was only 0.1414% and from a 62.3358 g

sample, loss was 0.1349%. This shows that SOLID is extremely durable at abrasive conditions, with minimal material loss.

VOC testing was performed by painting a pre-primed sample area, according to the manufacturer's directions, and allowing appropriate dry times between coatings. Testing results showed a VOC content of 14.6% by weight (Please refer to the following section for more information on SOLID VOC performance).

Accelerated weather resistance testing subjected the sample to a continuous 50 hours of UV radiation, elevated temperature and water spray. No cracks, surface variations or other effects were noted. Comparison of whiteness index before test (81.1) to whiteness index after testing (80.50) showed a total change in color of 0.6. Although light, heat and moisture are the main components leading to weatherization and deterioration of a product, the results are also dependant on the drying process, material to be painted, and application method. Therefore true simulation of weather effects is difficult, since as with natural weather, conditions are rarely held constant. Still, these results again show the durability of SOLID under dramatic conditions.

A Microtox 500 Analyzer was used to measure toxicity of the sample, which was transferred to a vial and diluted in accordance with testing protocol, the samples were found to have no toxicity effect on drinking water. Finally, pH-value analysis was performed to show the absence of any effect of the sample on the pH of drinking water.

LEED Scoring and Certification

Use of low-emitting materials, such as MCI SOLID paint, may contribute to the Leadership in Energy and Environmental Design® ("LEED®") green building certification process in the following credit categories:

Building Design + Construction
Indoor Environmental Quality:
IEQc4.2, Low-Emitting Materials – Paints & Coatings (1 Point)

The intent of this credit 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. Paints or coatings used on the building interior must comply with VOC content limits established in Green Seal Standard GS-11, Paints, 1st Edition, which limits VOCs to 250 g/L for commercial flat and non-flat high gloss paints.

Case Study

MCI Paints' SOLID was chosen for the MASTABA 2 project in Hurghada, Egypt. The project developer, International Development Programmes (IDP), chose MCI as the sole paint supplier for the MASTABA project due to the low VOC, high quality, durable nature of its products to meet the specific needs of the development.

The new MASTABA 2 project, located on a cliff in the heart of Hurghada, Egypt, close to various dining, shopping and night-life options, offers vacationers the option of renting a 818 ft^2 one-bedroom, one-bath Chalet or a 1,590 ft^2 three-bedroom, two-bath Apartment or a 3,050 ft^2 four-bedroom, three-bath Villa.

SOLID paint was chosen to be used in the MASTABA project because it is a high quality product with consumer–friendly pricing. SOLID was the only paint implemented on the project for all interior and exterior work across the project's multiple buildings. Multiple colors of SOLID are available, but for MASTABA the color code implemented was F200.

CONCLUSION

Green Buildings believes that MCI's SOLID paint product meets one significant criterion used in green building initiatives: **Increase occupant comfort and satisfaction**. Furthermore, use of SOLID is an effective choice when seeking to achieve certification under a green building rating system, such as LEED, by potentially earning points in the area of Indoor Environmental Quality.

Product Reviewed by: Sarah Gudeman, EIT, LEED AP BD+C & Rob Freeman, Jr., LEED AP

[i] Green-Buildings.com has evaluated and reviewed this product using its own methodology. While Green-Buildings.com believes that certain products have characteristics that may allow users of the products to earn points in a LEED certification, only the Green Building Certification Institute (GBCI) may award points and grant certification. Accordingly, Green-Buildings.com does not make any assurances, guarantees, representations, or warranties, express or implied, and specifically disclaims all warranties or representations, that products will earn LEED points, or any project that utilizes such products, will receive LEED® certification.