

SIMPLY BRILLIANT!



**Sustainability
Assessment of the
Bristone[®] Hard
Surface Polishing
Process**

Presented By:



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INTRODUCTION

Concrete polishing is surface finishing technique that first gained popularity in the mid 1990's when many contractors saw it as a low-cost decorative alternative to terrazzo. Since then, this unique floor restoration process has been expanded to include terrazzo, natural stone and vinyl composition tile (VCT) in addition to concrete.

The Bristone process, introduced by Nueflor, has become a preferred choice in all hard surface floor restoration projects because of its brilliant finish and its lasting durability. The Bristone involves grinding an existing floor surface to remove chips, scrapes and other imperfections, and then polishing the area to a glass-like sheen. As part of the process, hardening agents and other chemicals are burnished into the surface to add durability and intensify the shine. The process works equally well on concrete, marble, VCT or any similar surface.

The art of hard surface polishing can add new life to an old floor, eliminate mold and mildew problems, and serve as a less costly and less maintenance intensive alternative to hardwood or commercial carpeting. That's why the Bristone process has become a popular choice of building owners, architects and interior designers who are seeking "green" or sustainable construction alternatives. A floor that has been polished and protected by using the Bristone process is easier to maintain, saving both labor and electrical energy. It requires no harsh, smelly chemicals; and its brilliant gloss finish can add significant reflective light to an area thereby reducing the amount of needed artificial lighting. In addition, the Bristone process adds an additional measure of safety as the finished floor is more slip resistant than the previous untreated floor.

Nueflor has engineered the Bristone process to meet or exceed the "green" building and maintenance requirements set forth in the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program, as well as all similar sustainability initiatives.

WHAT IS LEED

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ is the nationally accepted benchmark for the design, construction, and operation of high performance green buildings. LEED gives building owners and operators the tools they need to have an immediate and measurable impact on the performance of their buildings. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.

LEED provides a roadmap for measuring and documenting success for every building type and for every phase of a building lifecycle. Currently, the USGBC administers five different LEED programs for commercial buildings. These include:

- **LEED for New Construction and Major Renovations**
 - This is the original LEED version and it is designed primarily for new commercial office buildings that are four or more stories tall. It can also be applied to major renovation projects involving existing buildings. As a rule of thumb, a major renovation includes the elements of major HVAC replacement, significant building envelope modifications and major interior rehabilitation.
- **LEED for Existing Buildings - Operations & Maintenance**
 - Recently revised and expanded, LEED-EB deals with the sustainability issues in operating and maintaining existing buildings. Unlike most other LEED versions, this one involves facility alterations and additions as well as operational issues and procedures for utilizing existing HVAC, lighting and other systems.
- **LEED for Commercial Interiors**
 - This LEED version deals specifically with the build-out of tenant spaces in government as well as private sector commercial buildings. In general terms, this initiative covers the areas of responsibility that a tenant of leased space normally has control of, such as interior floor and wall covering, maintenance and lighting.
- **LEED for Core and Shell Construction**
 - This is the opposite of the Commercial Interior version, structured specifically for the developer. It addresses the details of the building envelope in general, including the HVAC system, roof system and other components that are traditionally handled by the landlord in a tenant-landlord relationship.
- **LEED for Schools**
 - This version covers the construction and major renovations of K thru 12 educational facilities. It addresses the unique qualities of school spaces and children's health issues.

Additional LEED programs are also currently in development to address Retail Businesses, Healthcare, Community Development and other categories.

The LEED Rating System was created to transform the built environment to a higher degree of sustainability by providing the building industry with consistent, credible standards for what constitutes a green building. The rating system is developed and continuously refined via an open, consensus-based process that has made LEED the green building standard of choice for Federal agencies, as well as state and local governments nationwide.

The first step to LEED certification is to register a specific building project into one of the above-defined programs. A project is a viable candidate for LEED certification if it can meet all prerequisites and achieve the minimum number of points to earn the basic level of LEED project certification. The number of points needed to earn certification differs from program to program. To earn certification, a building project must meet certain prerequisites and performance

benchmarks ("credits") within each category. Projects are awarded Certified, Silver, Gold, or Platinum designations, depending on the number of credits they achieve. This comprehensive approach is the reason LEED-certified buildings have reduced operating costs, have healthier and more productive occupants, and conserve our natural resources.

It is important to understand that LEED rates projects, not products. LEED credits are earned when a product or a series of products are combined to achieve a specific end result (lower energy use, collective recycled content, etc.). It is rare when a single product can be utilized to earn credit points. The total number of available credits varies in each of the above categories. In addition to available credits, each of the above categories also contains one or more prerequisites which MUST be met in order for the project to achieve LEED certification. Examples of these prerequisites include minimum energy performance standards, the collection of recyclables, and requirements for smoking within the building.

LEED points are awarded in six basic categories:

1. Sustainable Sites (SS)
2. Water Efficiency (WE)
3. Energy & Atmosphere (EA)
4. Materials & Resources (MR)
5. Indoor Environmental Quality (IEQ)
6. Innovation & Design (ID)

POTENTIAL LEED CREDITS ACHIEVABLE BY USING NUEFLOR'S BRISTONE PROCESS

As mentioned previously, there are currently five LEED program in which Nueflor's Bristone hard surface floor polishing system can potential help earn credits in a registered LEED project. A summary of the available credits for each of these specific LEED versions in which the Bristone process can contribute potential points is as follows:

LEED - NC New Construction (& Major Renovations) Version 2.2

The LEED-NC Rating System is applicable to new commercial construction and major renovation projects. This was the original LEED program and still remains the one used most often. In LEED-NC there are a total of 69 available points. LEED Certification can be achieved as follows:

- Basic Certification 26-32 points
- Silver 33-38 points
- Gold 39-51 points

- Platinum 52-69 points

Nueflor's Bristone polishing process may contribute possible credit points in four specific LEED-NC categories. These include the following:

EA Credit 1
Optimized Energy Performance
1-10 Points

The intent of these credits is to achieve increasing levels of energy performance above the prerequisite baseline standards in order to reduce the environmental and economic impacts associated with excessive energy use. The baseline performance standard used for this calculation is ASHRAE/IESNA Standard 90.1-2004. In new construction, an increase of 10.5% over the baseline earns 1 point with a total of 10 points possible when the increase reaches 42%. In existing buildings, an increase over baseline of 3.5% earns one point, with maximum points possible with a 35% increase over the standard.

Numerous studies have documented how the heat retentive qualities of concrete offer an insulation value that can potential reduce energy consumption. A concrete floor is an integral part of a whole building approach to maximize a building's energy efficient design because concrete itself is considered to be a thermal mass. If the concrete is covered with terrazzo, VCT or other hard surface material, the insulation value is enhanced. The Bristone process includes densification and sealing of the hard surface which work in combination to reduce the cooling and heating loads within a building envelope.

Furthermore, the glass-like Bristone finish also works to reduce the energy requirement for lighting because of its reflective properties. This strategy is of particular importance to building teams seeking a design to maximize the natural light entering the building or the design and implementation of a day-lighting strategy, because it also can contribute to a whole building approach to energy reduction.

The specific number of LEED points available in this section for a floor surface finished with Nueflor's Bristone process will depend on the specific circumstances of the project. For example, if the building team can document that the Bristone protected floor has increased the energy efficiency of a building by 10.5 percent over the baseline building performance rating per ASHRAE/IESNA Standard 90.1-2004, then LEED-NC awards 1 point. A total of 10 points would be awarded for a 42 percent increase in energy efficiency.

MR Credits 1.1, 1.2 & 1.3
Building Reuse
1-3 Points

These credits involve salvaging of the buildings existing structural components, including the floor. One point is awarded for maintaining at least 75% (based on surface area) of existing building structure (including structural floor) and envelope (exterior skin and framing). A second point is added if the collective total reaches 95%.

These are significant credits when it comes to Nueflor's Bristone process because this system is specifically designed to rehabilitate and enhance existing hard surface floors. A building owner can opt to salvage the existing floor slab by removing the old carpeting, vinyl or wood and utilize the Bristone process to polish the concrete substrate surface as part of a strategy to earn these specific points.

Depending on the square footage of the surfaces involved, Nueflor's Bristone process may also contribute to maintaining 50 percent of the interior non-structural elements and therefore extend the life cycle of the building's existing floor and wall materials, thus earning an additional credit.

MR Credits 3.1 & 3.2

Material Reuse

1-2 Points

The intent of these credits is to reuse building materials and products in order to reduce demand for virgin materials and to reduce waste, thereby reducing impacts associated with the extraction and processing of virgin resources. To earn these points, the use of salvaged, refurbished or reused materials such that the sum of these materials constitutes at least 5%, based on cost, of the total value of materials on the project. The floor system is an included component.

Nueflor's Bristone process satisfies the requirements for this credit because it refurbishes the existing floor surface to like-new condition, thus eliminating the need to install new carpeting, wood or other flooring material over the existing concrete. In the case of existing terrazzo, marble or vinyl composition tile, the Bristone process refurbishes these materials to a brilliant finish, thus eliminating the need for removal and disposal of the existing floor.

MR Credits 5.1 & 5.2

Regional Materials

1-2 Points

The intent of this credit is to increase demand for building materials, processes and products that are manufactured within a 500-mile radius from the job site, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.

The components of the Bristone process are shipped from the Nueflor headquarters in Traverse City, Michigan. Therefore building projects within 500 miles of Traverse City could potentially qualify for this credit.

IEQ Credit 4.1

Low Emitting Adhesives & Sealants

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. VOC (Volatile Organic Compound) limits have been set for various categories of adhesives and sealer compounds in accordance with industry standards set by the South Coast Air Quality Management District (SCAQMD) Rule #1168.

The solvent-free chemical compounds that are used as part of Nueflor's Bristone process meet or exceed these standards and can therefore assist a project in achieving this credit. The products used in the Bristone process are mineral based inorganic compounds that prevent the growth of mold and other bacteria.

ID Credits 1.1 to 1.4

Innovation in Design

1-4 Points

This category makes available extra points to allow for the innovative use or application of product(s) or systems not otherwise addressed in the formal LEED credit structure. Cited examples include substantially exceeding a LEED-NC performance credit, such as energy performance or water efficiency. The strategy is to apply ideas or measures that demonstrate a comprehensive approach and quantifiable environment and/or health benefits.

The innovative nature of Nueflor's Bristone process lends itself to submissions in this category. The process yields a mirror-like finish which reflects both natural and artificial light, thus contributing to less required lighting and lower energy costs. Unlike carpeting, which can trap bacteria deep within its fibers and also foster mold growth, the bright, clean Bristone finish requires minimal maintenance and helps improve the overall interior environmental quality of the building. The inorganic mineral based Bristone products eliminate all mold and bacterial growth.

Another innovative Bristone feature occurs during the installation process, as all water used as part of the Bristone application is recycled and reused throughout the process and properly disposed of after the installation is completed.

Examples such as these can be properly documented with measurable performance, and can be submitted for Innovation points.

LEED EB: OPERATIONS & MAINTENANCE **(Formerly LEED for Existing Buildings)**

The old LEED-EB (Existing Buildings) has been radically changed and is now called: LEED EB: Operations & Maintenance. This is a significant change because this new program is quickly becoming adopted by municipal governments, non-profit organizations and hundreds of private commercial building owners as a blueprint for going green.

The importance of this program is based on the fact that there are an estimated 4.5 million commercial properties in the United States, the vast majority of which were erected decades ago before sustainable, or green, designs were even talked about. These older buildings presents a much bigger opportunity for the Bristone process as compared to new floors in new construction.

Unlike all other LEED versions, LEED EB: O&M is based on actual building operating performance, not design expectations. Among other categories, it specifically addresses site maintenance, the purchase and use of environmentally friendly products, and ongoing indoor environmental quality.

The new LEED EB provides sustainable guidelines for whole-building cleaning and maintenance, recycling programs and upgrades that help improve indoor environmental quality. To achieve certification under LEED-EM O&M, the building must earn a minimum of 34 points out of a total available 92 points. The award ratings break down as follows:

- **Basic Certification** **34-42 points**
- **Silver** **43-50 points**
- **Gold** **51-67 points**
- **Platinum** **68-92 points**

Basic criteria for consideration of certification include:

- Building must be fully occupied (based on average occupancy) for the 12 months prior to registration. A standard vacancy rate of 25 percent is acceptable.
- Good news for us, 100 percent of the floor area must be included in the scope of the project. There is an exemption of 10 percent if floor maintenance is under separate management control, but that's the only exception.
- The building must be in compliance with all federal, state and local statutes regarding issues such as lead paint, asbestos and other hazardous material concerns.

Nueflor's Bristone process can potentially contribute credits in as many as five specific categories, including one pre-requisite, as part of the LEED EB: O&M program. Here is a breakdown, detailing the rationale for the various credit assignments:

SS Credit 2

Building Exterior and Hardscape Management Plan

1 Point

This credit involves using environmentally friendly products and services to maintain outside areas. Specific conditions to earn this point involve the use of sealers involved in maintaining sidewalks and other exterior hard surfaces. If a building has a terrazzo or concrete walkway or outside courtyard area, adding the slip-resistant, low-maintenance protection of Nueflor's Bristone process can help earn this point.

EA Credit 1

Optimized Energy Efficiency Performance

2-15 Points

Essentially, these points are similar to the Energy Optimization points described previously in LEED-NC. The thermal retention benefits of concrete are much in play here when enhanced by the protection of Bristone. Between 2 and 15 points can be earned based on reducing the day-today energy use of a building.

One suggested strategy is to install Nueflor's Bristone process since it adds enhanced light reflectivity and results in the reduced use of mechanical scrubbing machines, buffers and polishers, thus saving energy.

EA Credit 6

Emissions Reduction Reporting

1 Point

This credit involves the implementation of a program that, among other factors, limits the potential release of Volatile Organic Compounds as well as large and small particulate matter. A strategy to polish the existing hard surface floor with Nueflor's brimstone process, as opposed to replacing the carpeting, vinyl or wood floor covering, could help qualify for this point. Another aspect that the Bristone process can add to this credit is the fact that its inorganic, mineral based formulation prevents the growth of mold and all other bacteria.

The important thing to remember here is that this point can be earned for planning the refurbishment in a written report and the Bristone process doesn't have to be done immediately.

MR Credit 3

Sustainable Purchasing: Facility Alterations and Addition

1 Point

This credit specifically addresses products and services used to expand or remodel a building and are based on total dollars spent for the project. There are two areas of interest that involve Nueflor's Bristone process.

This point can be potentially earned based on salvaging on-site resources, like the floor. The installation of Nueflor's Bristone process, eliminating the removal of existing terrazzo or VCT could help earn the point. The brilliant Bristone finish also eliminates the need for carpeting, wood or other floor covering material, contributing even more to the concept of sustainable purchasing. Also, dollars spent on the Bristone maintenance products also count toward achieving this point.

IEQ Pre-Requisite 3

Green Cleaning Policy

No Points

In LEED, a pre-requisite means every building must comply. This required mandate involves the development of a Green Cleaning Policy developed for the day-to-day maintenance of the building.

Specifically mentioned in the criteria is establishment of operating procedures for the cleaning and maintenance of hard-surface floors. Refurbishing an existing terrazzo, VCT, concrete or similar hard surface floor with Nueflor's Bristone process, and the on-going maintenance of those floors with the approved Bristone maintenance products, helps meet these required criteria.

IEQ Credit 1.5

Best Management Practices: Management for Facilities Alterations and Additions

1 Point

This category awards one point for reducing or eliminating air pollutants during tenant remodeling and renovation. This is very similar to EA Credit number 6, where you get credit for the plan rather than the action. Writing a plan to refurbish hard surface floors with the Bristone process during planned future remodeling can help earn the point.

IEQ Credit 3.1

Green Cleaning: High Performance Cleaning Program

1 Point

Criteria to earn the point include the use of environmentally friendly cleaning compounds and, most importantly, on-going training programs to teach the maintenance staff how to efficiently clean and maintain hard surface floors such as concrete.

This point can potentially be achieved if any of the building's concrete floors have been refurbished using Nueflor's Bristone polishing process and are maintained using the approved Bristone products, which are mineral based, VOC free organic compounds that eliminate mold and other bacterial growth.

IEQ Credits 3.2 & 3.3

Green Cleaning: Custodial Effectiveness Assessment

2 Points

Up to 2 points are awarded based in the category for developing programs for the training and effectiveness of the building maintenance crew. The point is awarded based on a periodic walkthrough and evaluation of the appearance of all common areas in the building.

The initial refurbishment of hard surface floors using the Bristone process as well as regular use of Nueflor's Bristone maintenance products can potentially help earn these points.

IEQ Credits 3.4, 3.5 & 3.6

Green Cleaning: Purchase of Sustainable Cleaning Products & Materials

2 Points

These points are awarded for the total dollar amount spent to buy environmentally friendly cleaning products for use in the building's day-to-day maintenance. You get 1 point for every 30 percent (based on the total dollar volume) spend for all green cleaning materials.

Assuming that Nueflor's Bristone process has been applied to one or more floor surfaces in the building, the purchase of Bristone maintenance products can help earn these points.

ID Credit 1.1 thru 1.4
Innovation in Upgrades, Operations and Maintenance
1-4 Points

As defined previous in the LEED-NC section. There are up to four potential points available in the Innovation category, based on the creative application or extraordinary effective of an application. The innovative Bristone water recycling installation process, potential enhanced daylighting, energy-saving maintenance and extraordinary IEQ properties have the potential to earn extra points here through of the Bristone process.

LEED FOR COMMERCIAL INTERIORS

The LEED-CI Rating System is applicable to tenant improvements of new or existing office space. This was designed to be a companion program to LEED Core & Shell, whereby a developer could register a shopping mall for LEED certification and earn points in the Core & Shell category. Tenant up fits would then register to earn points in this Commercial Interior category.

Under LEED-CI, a minimum of 21 points are required to achieve certification with a total of 57 possible points available. The breakdown of the various certification levels is as follows:

- Basic Certification 21 - 26 Points
- Silver 27 - 31 Points
- Gold 32 - 41 Points
- Platinum 42 - 57 Points

In most cases, the point methodology is the same as LEED-NC, with the same points awarded for the same strategies. In these cases, we list only the potential credits available with no further explanation. These opportunities for Nueflor's Bristone process in the LEED-CI program include:

- **MR Credit 1.2 & 1.3 – Building Reuse – 1 - 2 points**
- **MR Credit 3.1 & 3.2 – Resource Reuse – 1 - 2 points**
- **MR Credits 5.1 & 5.2 – Regional Materials – 1 - 2 Points**
- **IEQ Credit 4.1 – Low-Emitting Materials: Adhesives and Sealants – 1 point**
- **IEQ Credit 5 – Indoor Chemical and Pollutant Source Control – 1 point**
- **ID Credit 1 thru 4 – Innovation and Design - 1 to 4 points**

LEED FOR CORE & SHELL

As previously mentioned, LEED-CS is a market specific application that recognizes the unique nature of core and shell development; and acknowledges the limited sphere of influence over which a developer can exert control in specifying the implementation of green design and construction practices. It acknowledges that some key building areas, such as interior space layout, interior finishes, lighting, mechanical distribution, are often outside the direct control of the developer.

Under LEED-CS, a minimum of 23 points are required to achieve certification with a total of 61 possible points available. The breakdown of the various certification levels is as follows:

- Basic Certification 23 - 27 points
- Silver 28 - 33 points
- Gold 34 - 44 points
- Platinum 45 - 61 points

These points are the same as those described in the prior LEED-NC category. A listing of the potential points that Nueflor's Bristone process can potentially contribute toward LEED-CS certification are as follows:

- **EA Credit 1 – Optimize Energy Performance – 1 - 8 points**
- **MR Credits 1.1, 1.2 & 1.3 – Building Reuse – 1 - 3 points**
- **MR Credits – Material Reuse – 1 point**
- **MR Credits 5.1 & 5.2 – Regional Materials – 1 - 2 points**
- **IEQ Credit 4.1 - Low Emitting Adhesives & Sealants 1 Point**

LEED FOR SCHOOLS

The LEED for Schools Rating System recognizes the unique nature of the design and construction of K-12 schools. Based on LEED-NC, it addresses issues such as classroom acoustics, master planning, mold prevention, and environmental site assessment; issues that are especially pertinent to school spaces and children's health issues.

Under LEED for Schools, a minimum of 29 points are required to achieve certification with a total of 79 possible points available. The breakdown of the various certification levels is as follows:

- Basic Certification 29 - 36 points
- Silver 37 - 43 points
- Gold 44 - 57 points
- Platinum 58 - 79 points

Nueflor's Bristone process is especially adaptable to help contribute credit points in any registered LEED for Schools program for several important reasons. The durable surface can hold up to daily abuse and moist conditions found in locker rooms and cafeteria areas, and the superior mold, mildew and bacterial resistance is particularly effective in kitchens, restrooms and locker rooms.

Once again, these credit points have the same criteria as those previously defined in LEED-NC. But there is one notable addition. An additional point is available for mold & mildew control and those details are described below. Otherwise, Nueflor's Bristone can potentially contribute points in the following areas:

- **EA Credit 1 – Optimize Energy Performance – 1 - 8 points**
- **MR Credits 1.1, 1.2 & 1.3 – Building Reuse – 1 - 3 points**
- **MR Credits 3 – Material Reuse – 1 point**
- **MR Credits 5.1 & 5.2 – Regional Materials – 1 - 2 points**
- **IEQ Credit 4.1 – Low Emitting Adhesives & Sealants – 1 point**

IEQ Credit 10

Mold Prevention

1 Point

This credit is unique to LEED for Schools because it reduces the potential presence of mold in schools through preventive design and construction measures. One such strategy is to eliminate the use of carpeting and other floor coverings that traditionally induce mold growth.

Installation of Nueflor's Bristone process and the use of Bristone maintenance products are an effective remedy for on-going mold preventive remedy and could potentially help contribute toward earning this point. The products are mineral based inorganic compounds that prevent bacterial growth.

CONCLUSIONS

It really doesn't matter if an architect, designer or building owner has LEED points on his mind when he selects Nueflor's Bristone hard surface polishing process as either a part of a new construction project or a major renovation effort. The vast majority of so-called "green" building projects across the country never earn a LEED certification. But a majority of them use the LEED criteria as a guide for achieving their own pre-determined level of sustainability.

There are three general characteristics present in any legitimate effort toward achieving "green" or sustainable objectives. These include energy savings, a preservation of interior environmental quality (IEQ) and earth-friendly building practices, which embrace concepts such as materials reuse, recycling and minimal waste disposal.

It's important to understand that Nueflor's Bristone process embrace qualities from all three of these areas, making a true "green" process. The thermal mass and insulation qualities of concrete enhance the overall energy performance of a building and the application of the Bristone process makes the floor look better and last longer, and the installation process results in a very minimal landfill impact. The process makes existing terrazzo, VCT, marble and other natural stone surfaces look better than new and eliminate the need to replace these materials.

The low-maintenance features of the Bristone process save both energy and labor and contain no harmful VOC's. The Bristone process leaves no opportunities for mold or other harmful bacterial growth, which occurs routinely with carpeting. There is also no grout to absorb odors and there no cracks or joints to trap dirt and grease. The Bristone hard surface polishing process yields a clean, healthy surface that reflects light and requires minimal maintenance. Products like Nueflor's Bristone process will always have a place in our green future.



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