The range of flooring options available in today’s marketplace is vast, with each of these alternatives offering unique appearance and performance characteristics. As a result, owners and design professionals must evaluate many factors to determine the best flooring option for a structure’s given needs and environment.

One flooring system or option currently gaining in popularity is polished concrete. Although polished concrete is relatively new in North America (approximately 15 years), the system offers many advantages. Concrete is a durable material, and thus meets an important sustainable-design criterion. In addition, the polishing process enhances concrete’s natural appeal. These attributes have contributed to the increased use of polished concrete in public and institutional buildings such as schools, hospitals, retail stores, restaurants, and other settings.

In this discussion, we will seek to provide a review of the polished-concrete process, which involves a sequence of steps that begins with initial grinding and preparation of the floor. Application of densifying agents and polishing with machines employing diamond-grit discs produce a surface that is durable, attractive, and highly reflective. A major factor in the integrity and performance of polished concrete is the use of high-quality liquid hardener and densifier materials.

Polished concrete: An overview

Polished concrete, because it does not involve a coating, is a breathable system—one that allows transmission of water vapor and thus is not subject to failure due to moisture migration from below. When properly installed and maintained, polished concrete can last the life of the structure, avoiding the time and labor of installing subsequent flooring systems.

Polished concrete can be used in almost any interior area. In exterior settings, however, acid rain has a tendency to prematurely etch the surface and cause early deterioration of the shine. Polished concrete can be treated with integral concrete colors, color dyes, and edge-tinting products to produce an attractive floor surface.

Maintenance is relatively simple and economical, and involves cleaning the surface with an agent formulated for this purpose. A concentrated cleaning solution with a neutral pH is added to the cleaning water in an auto scrubber. The auto scrubber applies the cleaning solution, buffs, and vacuum any remaining solution and dirt particles, leaving no residue and a clean surface. Maintenance of polished concrete is quite low in cost, averaging 5 to 7 cents per square foot per year. No special waxes or strippers are required.

Dry or wet process

With dry polished concrete, vacuum are dry-slurry is used to remove waste concrete particles. The wet-grinding process requires special disposal methods. With dry polished concrete, pre-separation of concrete and mix design, and prep must be complete, the densification results in a durable, dense, and sealed surface in maturely etch the surface and cause early deterioration of the shine. Polished concrete can be treated with integral concrete colors, color dyes, and edge-tinting products to produce an attractive floor surface.

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Polishing revs up the performance of concrete floor at racecar art center

They may be making a extended pitstop for cosmeticalterations, but the sleek racingcars at JKS Motorsports in the heart of North Carolina’s NASCAR country also appear to float on the shimmering polished-concrete floor at the company’s new facility in Welcome, NC.

JKS Motorsports, which creates logos and other artistry that decorates stock-car racing vehicles, placed a bet on polished concrete as a practical, but eye-catching, surface for the company’s new facility. The process transformed 34,000 square feet of plain gray concrete into a glistening, reflective surface courtesy of the INDUSSTONE system developed by W.R. Meadows Inc.

The facility was a design/build project by Samet Corp., Greensboro, NC. The concrete contractor was Tried Construction Services, High Point, NC. The concrete polishing contractor was Alan Durden, Raleigh, NC. Casey Chandler, W.R. Meadows’ sales representative in the Carolinas and Virginia, gave high marks to Tried for installation of a high-quality, hard-traveled, water-based, 3,500 psi concrete mix design, providing a sound basis on which to work some polished-concrete magic.

Chandler says he was able to make a case for the polishing process, based on attributes that include light reflectivity, durability, slip resistance (important to the contrary), and resistance to abrasion, oil, and chemicals. A key selling point was the relative permanence of the polished and finished concrete. The polishing process is without a doubt labor intensive, but should not have to be repeated if successfully executed.

“With polished concrete, it’s essentially a one-shot deal,” Chandler says. “You are changing the composition of the concrete, and it’s a permanent solution.”

The project began with initial grinding to prepare the surface for application of the liquid sodium silicate densifier, with 45, 60-, and 150-grit discs used. W.R. Meadows’ Lazy Hard-Grinder was spaied applied, then left in place for a dwell time of 45 minutes to an hour. Any excess densifier remaining on the surface was then removed with water and shop vacuum.

The next day, the polishing was completed with increasingly finer diamond grits of 100, 140, and 1500 grits. In some projects, the polishing steps can progress all the way to a 3,000-grit stage, but the hard-traveled concrete in this case didn’t require the finer-grit polishing. Chandler says Chandler concedes that the techniques are “something like an art. You have to evaluate the conditions and operate sophisticated machinery.”

A final step was applying W.R. Meadows’ Bellevue, a proprietary topical treatment that enhances reflectivity and resistance to stains from oil, gas, and other petroleum-based substances. The owner opted to omit the inherent gray color of the concrete rather than introduce color by means of integral coloring of the concrete or final application of stains or dyes. A 10-inch wide strip of solid-color epoxy coating was applied, however, to floor edges along walls that were not given the polishing treatment. A separate edge treatment of this type is often recommended due to the logistical limitations of the grinding and polishing equipment. The heavily colored coating provides contrast—an accent to the natural color of the concrete surface.

The resulting mirror-like, polished surface stands in marked contrast to the slate-gray of a conventional concrete floor. For JKS Motorsports, it has the look of a winning entry.

“Gentlemen, start your polishing-machine engines!” —Joe Maty, Editor, JAC

Polished concrete: An effective solution on several counts

With the vast amount of flooring options available today, architects, specifiers, and owners are well advised to consider all available options to meet the needs of a structure and its occupants. Issues such as durability, safety, initial and ongoing maintenance costs, replacement needs, the service environment, and the environmental profile of the system should be weighed in determining the ideal flooring system for the given setting. Polished concrete can provide an answer to many of these needs by enhancing a common building component—concrete—that meets the definition of a sustainable building material in many ways.

In evaluating any flooring option, it is important that best practices and detailed specifications are employed. Effective choices regarding flooring systems can deliver safe, environmentally friendly solutions that are cost effective and contribute to the highly coveted goal of sustainability in design and construction.