

THE CONCRETE FLOOR REPORT

NEWS FOR EVERYONE WHO DESIGNS, BUILDS, MAINTAINS, OR OWNS CONCRETE FLOORS

A Publication of The MJA Company, Serving New York Since 1988

REFLECTION

Clearing Up The Appearance Of Polished Concrete

Polished concrete

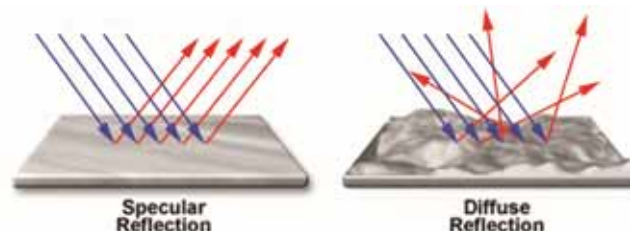
In our last issue, we outlined five documents that were released by the Concrete Polishing Council (CPC). The CPC is a specialty council of the American Society of Concrete Contractors (ASCC). The documents are intended for the Design Community, Architects, Owners, General Contractors, and Concrete Slab Contractors. The publishing of these five documents is a key part of the CPC's goal to establish a clear, concise, and technical foundation for the concrete polishing industry.

One of these documents is the "Polished Concrete Appearance Chart" (see page 2 for the chart). This document defines a specific characteristic of polished concrete, namely the appearance. It defines four levels of appearance using two measurable quantities, "Distinctness-of Image" (DOI) and "Haze Index". In this article I will discuss how a polishing contractor produces a smooth, highly reflective surface to produce the desired DOI. Before I talk about that polishing process let's take a look at how the surface flatness affects the image quality.

Surface flatness and reflection

Like any mirror surface, the reflection of an image off a polished floor can be explained using two simple diagrams. They show how a mirror like, clear image reflection (Specular Reflection) and a blurry image (Diffuse Reflection) are formed. The light coming off a highly polished surface reflects in an orderly manner and produces a clear image. Light reflected off a rough surface will not form a clear image. How does this relate to the DOI?

DOI is the sharpness of the image reflected off the surface and measured as a percentage with 100 representing perfect image clarity. The measurements are made with an Image Clarity Meter. The question is how do the different levels on the Appearance Chart relate to the actual work that a concrete polishing contractor has to do?



The grinding process

The grinding process is much like the process a craftsman would use to sand wood to a smooth finish for a piece of furniture. Let me explain. On our website, under How the Diamond Polishing of Concrete is Done, we explain the polishing process:

"Much like finishing a fine piece of wood, diamond-polished concrete floors are made smooth and shiny through a series of polishing phases."

"The polishing begins with course grit diamond impregnated tooling (6-150 grit) gradually moving to very fine diamond tooling (200-3,000 grit)."

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CONCRETE POLISHING COUNCIL POLISHED CONCRETE APPEARANCE CHART

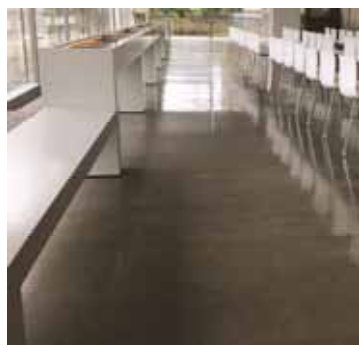
LEVEL	NAME	IMAGE/DOI VALUE
1	Flat (Ground)	"flat appearance" 0-9
2	Satin (Honed)	"matte appearance" 10-39
3	Polished	"image is not sharp or crisp but can be easily identified" 40-69
4	Highly polished	"near mirror like reflection" 70-100

POLISHING STEPS

DIAMOND TOOLING USED
6-150 grit metal bond (2-5 steps)
150-200 grit hybrid or resin bond (2 steps)
400-1500 grit resin bond (2 or 3 steps)
1500-3000 grit resin bond (1 or 2 steps)

Diamond tooling

The tooling used early on in the process are bonded into a metal matrix and are very aggressive. These metal bonded tools start at 6 grit diamond tools move up in steps to the 150 grit level. Once you hit the 200 grit level the matrix that the dia-



mond chips are bonded into is transitioned to a resin material and the diamonds are less aggressive. The resin bonded increase in increments as high as 3,000 grit diamonds. One important part of the process to meet higher levels of DOI is that the contractor must

fully refine the surface at each step. That is, each step should fully remove the scratch pattern on the concrete from the previous step. Now let's look at how the tooling and steps taken relate to the levels on the Appearance Chart above.

The chart gives you an idea of the type of diamond tooling used and the possible number of steps in the process of grinding

and polishing a concrete floor. I must add that the number of steps you must go through is determined by the nature of the concrete. Finding the right grit diamond tooling to start with and the number of steps you have to do comes with training and experience and is part of the art of polishing concrete. Of course, there are other factors that guide the polishing process.

The polishing process

One of the main factors that must be taken into consideration is the canvas that the contractor is working with. That is, what kind of shape is the concrete floor in to begin with? There are three key factors to consider when polishing concrete:

- **The age of the concrete.** (Generally new concrete is easier to work with.)
- **The hardness of the concrete.** (Most of the time the concrete here in Western New York is hard.)
- **The condition of the concrete?** (Is the surface very rough, cracked, or in need of repair?)

The worse the condition of the concrete the more steps the contractor will have to take to meet the specified polish level.



**PROJECT
WATCH**

Spot Coffee | Amherst, NY
1,000 sq ft polish to 800 grit finish

Labatt Brew House | Buffalo, NY
1,500 sq ft of grinding to level the brick flooring surface and a top coat with a polyaspartic resin.

Performance Advantage Company | Lancaster, NY
2,400 sq ft of solid color epoxy base with decorative flake broadcast topped with a clear polyaspartic top coat



Spot Coffee | Amherst, NY

Consistency in diamond polishing

As you can see, the polishing of concrete is a complex process. The industry has made great strides in the diamond polishing process. Over the last fifteen to twenty years the polishing industry has matured, with many manufacturers developing new tooling and chemicals that have helped the contractor to get a consistent and durable polished concrete surface.

Even though these advancements have helped floor consistency, the results of the polishing process remained very subjective. The new standards published by the CPC give us a new test to quantify the clarity of the polished floor. This will help to reduce the subjectivity of judging the results of the polishing process and move the industry closer to reaching the CPC's goal to establish a clear, concise, and technical foundation for the concrete polishing industry.

About the author

Jim Guido is the editor and a contributing writer to The Concrete Floor Report.



MJA used a 480-volt, three-phase electric Spider CP 9200 to finish the 235,000 square feet polishing project within a 10-week deadline

The Thermo Fisher Project Completed by The MJA Company was Featured in Concrete Construction Magazine

The MJA Company recently completed a 235,000 square foot floor polishing project for Thermo Fisher. The building was an old Kodak warehouse in Rochester, NY.

"Thermo Fisher told MJA the floor must be smooth enough not to break fragile items being moved around on a forklift. The surface was in bad shape; in addition to the usual crack and joint repairs, metal track imbedded in the slab had to be cut out, filled, and smoothed to minimize jarring bumps. MJA recommended an industrial finish, its term for a surface that's not too shiny and fully refined but may still have small imperfections."

To meet the requested 10 week deadline, MJA had to complete 4,500 to 5,000 square feet a day. For that capacity, a massive ride-on grinder/polisher was rented to supplement the SASE Co. walk-behind grinders.

Johnston, Stephanie. "Bring On The Big Guns!" Concrete Construction. July 18, 2018

RESIDENTIAL MAKEOVER

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MJA Signature Series garage floor finishes hide dust, dirt, and road contaminants. Your new garage floor finish will resist stains and UV fading for years of carefree performance and beauty.

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Win Dinner for Two!

Name This Place

Just tell us at which WNY site this photo was taken for your chance at dinner for two. (A \$100 gift card to be used at the restaurant of your choice.)



Enter to win at www.themjacompany.com/promo

Contest ends May 31, 2019

Previous Answer & Winners

Answer to the contest in the last newsletter: The Darwin Martin House

Previous winners: Laura G. of West Seneca, NY

Robert F. of Wendel