

GROUT COLOR: WHY DOES IT LOOK DIFFERENT?

GROUT COLOR

Color comprises a large and important portion of our lives. The magic of color interaction is that our perception of a color changes when the color is viewed under different conditions. The way color appears is affected by the environment in which the color is seen.

Rarely do we see a single, isolated color. They are always seen next to other colors. Hue, value and intensity describe a color as we see it; however, these attributes can dramatically change when the color is placed in the context of surrounding colors and materials of different textures. Some combinations are naturally pleasing and some colors clash with each other based on their position in the color spectrum.

A grout color selected in a brightly lit show room can appear quite different after installation, depending on the colors in the room and the interior lighting conditions. It is frustrating (and expensive) to install a colored grout with the perfect tone for a particular scheme, only to discover that it appears to have a different shade when applied between the tiles.

Changes in color perception occur whether we want them to or not, so it is critical for project owners and designers to understand how colors interact and to anticipate those interactions.

CURING OF THE GROUT

Cement grouts cure by hydration of the cement in the grout. The color of the hydrated cement is generally lighter than that of the un-hydrated cement. If the grout is not fully cured, it may not yet have achieved the color that was selected from the color cards or sample grout channels. It is important to mix grout powder with the proper water ratio and follow manufacturer's directions for the installation of the grout to obtain the correct color. Higher performance cement grouts like Prism® will cure quickly, and in many cases, reach the desired color sooner than traditional cement grout. To assure the accuracy of the color in your project, and not be dependent on the cure state of the grout, use a Single Component® grout like Fusion Pro® or an epoxy grout like CEG-Lite™ in your tile project. These grouts do not rely on hydration of the

cement and the differing colors of the hydration states. The resins and pigments in these formulas will maintain the same color throughout their curing cycle. Fusion Pro will cure to the same color regardless of the tile type, substrate or environmental conditions.

GROUT TEXTURE

The texture and finish of installed grout are a result of the type of grout used and the installation and finishing techniques used by the installer. Surface texture and finish alter the way color is perceived. Rough, textured areas of raised sand in a sanded grout will appear darker in color. Smooth areas found with non-sanded grout and over-worked sanded grout will appear lighter in color.

Today, it is not uncommon to find different types of grout on the floor (e.g., epoxy grout) and the wall (e.g., cement grout) plus a silicone sealant used in the corners and movement joints. All of these materials have slightly different textures and can therefore appear as different colors, even though they were color matched to the same color standard. The source of lighting that a tile installation is exposed to can also accentuate surface irregularities by casting shadows on the tile surface and grout joints and affect the perceived color of each.

LIGHTING

Metamerism is the phenomenon of colors changing when viewed in different light sources. The grout color that looked great with the tile in the showroom is not even close when installed. The problem is the light source. You may have picked the grout color in the showroom under fluorescent lighting but the installation site may be in a mix of daylight and incandescent lighting. The perceived color of the different types of grout, printed samples, plastic channels and ceramic tile will change as the light source changes and most of the time the change is not in the same direction. It is important that you view the grout and tile combination in the lighting found on the project. Creating a test panel and evaluating it in the location of the intended installation is highly recommended for any tile installation.



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MAINTENANCE

Unfortunately, the color of many grouts will not remain the same over time. As the grout becomes contaminated with spills and even cleaning agents, the perceived color will drift. Sealing a cement grout with Aqua Mix® Sealers Choice® Gold or installing stain resistant grout like Fusion Pro or CEG-Lite will make it easier to clean and maintain the original color longer. Note that epoxy resin will yellow when exposed to the UV from sunlight and this can result in color shifts for epoxy grout. To keep the original, intended color as long as possible, it is important to install as well as maintain the grout based on the manufacturer's directions.

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MINIMIZING GROUT SHADING

CAUSES

Inconsistent grout color is a condition where colored grout dries to its expected color in some areas, a darker color in other areas, and varying shades in between. The main cause for this variation in color is uneven drying of the Portland cement in the grout. There are job site conditions and factors which create the conditions for uneven drying and improper cement hydration. Inconsistent grout color is not considered a manufacturing defect due to the inconsistent nature of Portland cement. Portland cement is a natural product, mined from the ground, with inherent properties which cannot be completely controlled.

Colored grouts, like concrete, are a combination of Portland cement and an inert aggregate. It is not uncommon for concrete driveways or sidewalks to show discoloration and inconsistent color. Like colored grout, this is mainly due to the uneven drying of the cement. Unlike grout, this is an understood and accepted fact. Because of grout's decorative aspect, inconsistent color creates an unacceptable look to the installation.

PREVENTATIVE CONTROL FACTORS

Evaluation of the job conditions and the materials to be used are the primary controlling factors that determine the outcome of the job and help minimize inconsistent grout color.

As in all cases, if proper precautions are taken before a job is started, many problems that are within the realm of your control may be prevented, assuring a satisfactory job. The following is a suggested checklist to produce the best possible results when grouting a ceramic tile installation:

- ▶ Use the same person to mix the grout and maintain the same mixing technique throughout the job.
 - ▶ Dry mix the entire grout bag if only one bag is used. Dry mix bags of grout together if more than one is used.
 - ▶ Wait at least 24 hours before grouting a dry-set installation, 48 hours for organic (mastic), 72 hours for conventional mortar bed.
 - ▶ Maintain uniform width and depth of the grout joints.
 - ▶ Remove all tile spacers and debris.
 - ▶ Leave 2/3 of the joint open for grout.
 - ▶ Plan grouting to not join in conspicuous areas.
 - ▶ Shade tile work in hot or windy conditions to prevent rapid drying.
- ▶ Mix grout thoroughly by hand or with a low RPM (300 rpm) power mixer.
 - ▶ Always mix the grout powder into the liquid.
 - ▶ Mix grout to a stiff, creamy, paste-like consistency.
 - ▶ Allow grout to rest (slake) once mixed, then remix.
 - ▶ Discard grout when it becomes too stiff to work.
 - ▶ Use the same procedure to grout all areas.
 - ▶ Use a rubber grout float to remove grout from tile during installation.
 - ▶ Allow grout to firm in the joint before any further cleaning. Porcelain tile will require more time. Grout is firm when it can only slightly be indented when pressed hard with your fingernail.
 - ▶ Use as little water as possible for clean-up. Use a small pore hydro grout sponge or cheesecloth.
 - ▶ Change bucket wash water often.
 - ▶ Buff the tile surface and grout with a cheesecloth or clean, dry towel within one (1) to two (2) hours to remove all water and grout residue from the surface of the grout.
 - ▶ Lightly mist with clean, cool water for 72 hours to ensure slow, even curing.

If minor shade variations occur, they will disappear over time. In most cases, shading occurs mainly on the surface of the grout, and can be removed 7 to 10 days after grout is installed with TileLab® Sulfamic Acid Cleaner. For specific cleaning procedures, contact CUSTOM® Technical Services.

Colored grout is a natural and beautiful companion to any tile installation. The result of proper application and techniques will produce a grout installation that is stronger, harder, smoother, denser and more uniform in color.

REFERENCE DOCUMENTS

- ANSI A108.10
- NTCA Reference Manual A-21
- MMSA Bulletin No. 9

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DARKENING OF GROUT JOINTS IN WET AREAS

Portland cement grout darkens when wet. This is especially noticeable with colored sanded grouts that remain dark while wet in areas such as shower stalls, steam rooms, sunken tubs, pools and spas. In shower stalls, the floor and the first several rows on the wall areas will darken immediately after getting wet. These areas will remain dark until the water evaporates or drains out.

Shower areas may dry, leaving a dark or discolored look to the shower base and stall due to contaminants that may be present in the water. These contaminants include soap, shampoo, conditioner, soap scum, body oils, hard water minerals and dirt.

Improper drainage or insufficient slope may prevent proper drying. Blocked weep holes at the shower base may allow moisture to collect in the lower areas of the stall. Slow drains will allow standing water to collect in the lower portion of the stall, which can leave stains from dirty or soapy water.

Normal cleaning is usually sufficient to remove surface accumulation. Use a neutral TileLab® cleaner with a nylon scrub pad or brush. Installations that experience hard water spotting or deep deposits can be cleaned with a mild solution of TileLab® Sulfamic Acid Cleaner. Please contact CUSTOM® Technical Services for additional corrective procedures.

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