

Tile & Stone Installation Systems

The evolution of high-performance, premium tile grouts

High-performance, premium grouts are taking more market share of the tile grout installation industry. Several factors have driven this movement away from ordinary Portland cement (OPC) grouts that have traditionally been considered the “workhorse” grout for tile installations.

One key factor that has allowed contractors and installers to “upgrade” their grout selection to premium grouts has been price. The cost per square foot to upgrade to premium grouts is less today given that the typical grout joint width is now between 1/8” to 3/16” versus the 1/4” average gap width that was used for years to set tile. In addition, the popularity of large-format tile (LFT) designs versus the smaller tile size of the past requires fewer grout lines per square foot of tile. Consequently, you get more coverage given the smaller gap widths and larger tile designs used today. More coverage helps to offset the cost to use a premium grout. OPC grouts range in cost per square foot depending on whether they are sanded or unsanded OPC grout (see Table A below). On average, the cost per square foot is around \$0.04 USD for sanded OPC grout. For premium powder grouts, the cost per square foot averages around \$0.06 USD. The cost associated with using a premium grout versus an OPC grout has dropped to as little as \$0.02 per square foot. On a 1,000-square-foot installation, the cost to upgrade to a premium grout is less than \$20 (see Table A below).

Another key factor driving the movement to premium grouts is quality-related. For years, efflorescence, shading, discoloration and mottling of grout have been the primary sources for grout complaints. The sensitivity of OPC grouts to many different installation variables is commonly the source of the complaints. With premium grouts, there is much less sensitivity to installation variables. And, in most premium grouts, efflorescence cannot occur given the lack of Portland cement. However, there are a few premium grouts that are still formulated with some level of OPC. These grouts would be susceptible to efflorescence. It is important to review the technical data sheets (TDSs) and safety data sheets (SDSs) of all products prior to use.

Premium performance cement grouts meet or exceed the industry standards ANSI A118.7 and ISO 13007 classification CG2WAF. These grouts offer improved color consistency, no efflorescence, and overall superior performance properties. In contrast, OPC cement grouts meet the industry standard ANSI A118.6 and ISO 13007 classification CG2WA. When you compare ANSI A118.6 to A118.7, the specification standards under A118.7 are much higher. This ensures that your premium grout tile installation will have improved performance results and less potential for callbacks.

Another category of grout can also be considered part of the “premium grout” family. This grout category is known as RTU or Ready-to-Use grout and has recently grown in popularity. Currently RTU grouts do not have an ANSI or ISO industry standard. However, TCNA (Tile Council of North America) is actively working on an industry standard for this category of grout.

The RTU grout category has evolved over the last five years or more from the premixed grouts of the past to a premium, high-performance grout category that is “ready-to-use,” faster to install, and the ultimate in terms of stain and chemical resistance. RTU grout has been compared to epoxy grout in terms of its stain and chemical resistance. However, RTU grout is much easier than epoxy grout to install. Installation variables are minimized with this product, as no water and no mixing are required.

Color consistency is another attribute of RTU grout, as many (but not all) of the grouts from this group are formulated with coated quartz versus free pigment. As a result, pigment washout cannot occur as the pigment color is bonded to the quartz particle. Efflorescence is an impossibility with this grout type as there is no Portland cement present in the formulation.

RTU grouts can be formulated with either a urethane, acrylic, or hybrid chemistry. These products typically cure by dehydration. As a result, installation in high-humidity environments can result in a delay in the curing process. Pricing for RTU grout is typically double that of premium powdered grout (see Table A below). However, ready-to-use grout has many benefits from an ease-of-installation standpoint. And the overall performance is superior, especially as it applies to stain and chemical resistance.

Finally, there is the epoxy grout category. Epoxy grouts are divided into two different subcategories: Non-industrial- and industrial-grade epoxy grout. Epoxy grouts meet or exceed industry standards ANSI A118.3 and ISO 13007 classification R2/RG.

Epoxy grout is essentially impervious with less than 0.1% water absorption. Epoxy is considered the most robust grout category with excellent stain and chemical resistance. However, the installation can be more challenging as epoxy grouts are generally two- or three-component mixtures that require special mixing and handling at the jobsite.

Skin allergies can also occur with a small percentage of installers. Proper PPE can help minimize the potential for this reaction. An important formulation

attribute that differentiates some epoxy grouts from others is whether they are 100%-solids or water-based formulations. 100%-solids epoxy grout traditionally has superior performance when compared to water-based epoxy grout. Pricing of this grout is by far the highest of all the grout categories. And it varies in price depending upon whether it is a non-industrial- or industrial-grade epoxy grout (see Table A).

In conclusion, there are a lot of options available when it comes to tile grout. We have identified some of the key characteristics of each of these grout categories, as well as how upgrading to premium grout can help ensure a more successful tile installation.

Always remember to identify the installation environment when selecting the right grout for the job. For example, is the jobsite a commercial or residential installation? Is the jobsite interior or exterior? Is it a high-traffic area? Is the installation below the water line in a pool or spa? Will you be installing tile or natural stone? Today, many manufacturers utilize the TCNA Environmental Classification system (see Table B) to assist in selecting the right grout for the job. With this system, it is easier to match the installation type to the grout, to ensure you select the best product for the job.

Table A

**Grout price per square foot
based on 12" x 24" x 3/8" tiles with 1/8" gap**

Grout categories	Average list price	Coverage in sq. ft.	Cost per sq. ft.*	Cost per 1,000 sq. ft.*
Portland-cement sanded grout (25 lbs.)	\$20.00	510	\$0.039	\$39.00
Portland-cement unsanded grout (25 lbs.)	\$21.00	710	\$0.030	\$30.00
High-performance powdered grout (25 lbs.)	\$30.00	530	\$0.057	\$57.00
Ready-to-use, premixed grout (1 gal.)	\$60.00	295	\$0.203	\$203.00
Epoxy grout (1 gal.)	\$80.00	295	\$0.271	\$271.00
Industrial-grade, epoxy grout (1 gal.)	\$100.00	295	\$0.339	\$339.00

Note: \$18 per 1,000 sq. ft. to upgrade to a premium grout

* Cost based on average list pricing

Table B



TCNA environmental classifications for grout

Res1 (Residential Dry)	No moisture exposure
Res2 (Residential Limited Water Exposure)	Some moisture exposure, but not soaked or saturated
Res3 (Residential Wet)	Intermittent water exposure
Res4 (Residential High Humidity, Heavy Moisture)	Steam showers, etc.
Res5 (Residential High Temperatures ≥ 125°F)	Furnace and boiler areas
Res6 (Residential Exterior)	Tile surfaces exposed to exterior conditions
Res7 (Residential Submerged)	Tile surfaces exposed to continuous water submersion
Com1 (Commercial Dry)	No moisture exposure
Com2 (Commercial Limited Water Exposure)	Floors in bathrooms, lockers, etc.
Com3 (Commercial Wet)	Intermittent water exposure
Com4 (Commercial High Humidity, Heavy Moisture)	Steam showers, etc.
Com5 (Commercial High Temperatures ≥ 125°F)	Furnace and boiler areas
Com6 (Commercial Exterior)	Exterior walls, balconies and decks
Com7 (Commercial Submerged)	Swimming pools and fountains

MAPEI Grout Categories



Original Portland-cement (OPC) powder grouts

Premium, high-performance powder grouts



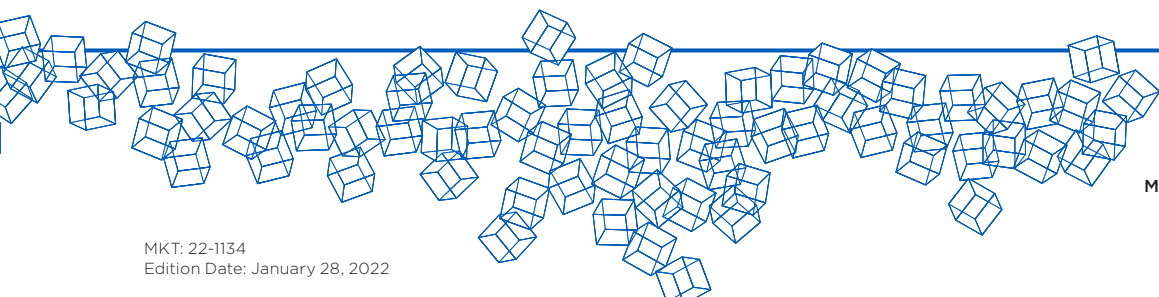
Ready-to-use/premixed grouts



Non-industrial-grade grouts

Industrial-grade grouts

Epoxy/reactive-resin grouts



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